

WHAT IS CLAIMED IS:

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1. A method for therapeutically treating an injury using ultrasound, the method comprising the steps of:
introducing an ultrasound contrast agent into a patient; and
impinging ultrasonic waves in proximity to the injury, wherein the ultrasound contrast agent facilitates in lowering the cavitation threshold to a level attainable by the ultrasonic waves.

10 2. The method according to Claim 1, further comprising the step of maintaining the acoustic spatial average-temporal average (SATA) intensity of the ultrasonic waves from 5 to 500 mW/cm².

3. The method according to Claim 1, wherein the ultrasound contrast agent is comprised of microbubbles having a radius from 0.1 to 10.0 μ m.

15 4. The method according to Claim 3, further comprising the step of maintaining the resonance bubble frequency of the microbubbles from 0.5 MHz to 10 MHz.

5. The method according to Claim 1, further comprising the step of maintaining the acoustic transmit frequency of the ultrasonic waves from 10 kHz to 10 MHz.

20 6. The method according to Claim 1, further comprising the step of terminating the impinging step after approximately thirty minutes.

7. The method according to Claim 1, wherein the step of introducing comprises the step of time-releasing the ultrasound contrast agent into the patient.

8. The method according to Claim 1, wherein the step of introducing comprises the step of using a syringe to intravenously introduce the ultrasound contrast agent into the patient.

9. The method according to Claim 1, wherein the step of introducing comprises the steps of:

placing the ultrasound contrast agent within a timed-release capsule; and
placing the timed-released capsule within the patient.

10. The method according to Claim 1, wherein the step of introducing comprises the steps of:

placing a capsule housing a sensor and the ultrasound contrast agent inside the patient; and

transmitting a signal to the sensor instructing the capsule to release the ultrasound contrast agent.

11. A kit for therapeutically treating an injury using ultrasound, the kit comprising:

an ultrasonic transducer assembly having at least one ultrasonic transducer;

an ultrasonic signal generator positioned in the ultrasonic transducer assembly;

a main operating unit electrically coupled to the ultrasonic signal generator for transmitting at least one signal thereto for activating the at least one ultrasonic transducer for emitting ultrasonic waves; and

an ultrasound contrast agent.

12. The kit according to Claim 11, wherein the ultrasound contrast agent is housed within a syringe.

13. The kit according to Claim 11, wherein the ultrasound contrast agent is housed within a timed-release capsule.

14. The kit according to Claim 11, wherein the ultrasound contrast agent is housed within a delivery/release system having means for responding to the ultrasonic waves.

15. The kit according to Claim 11, wherein the ultrasound contrast agent is comprised of microbubbles having radii from 0.1 to 10.0 μm .

16. The kit according to Claim 11, further comprising a placement module configured to be worn by a patient, the placement module being configured to receive the transducer assembly such that when the placement module is worn the at least one ultrasonic transducer is positioned in proximity to the injury.

17. The kit according to claim 11, wherein the ultrasonic signal generator includes signal generator circuitry and an internal power source connected to the signal generator circuitry, and the signal generator circuitry including a processor and means for generating a pulsed RF signal.

18. The kit according to claim 11, wherein the main operating unit is positioned within a pouch worn by the patient to permit portable operation thereof.

19. The kit according to claim 11, further comprising a gel-like substance for acoustically coupling the ultrasonic waves, emitted by the at least one ultrasonic transducer, to the body of the patient.

20. A method for therapeutically treating an injury using ultrasound, the method comprising the steps of:

5 providing a main operating unit having an internal power source coupled to an ultrasonic transducer assembly, the ultrasonic transducer assembly includes at least one ultrasonic transducer, an ultrasonic signal generator and signal generator circuitry therein;

10 providing a placement module configured for receiving the ultrasonic transducer assembly and for placing the at least one ultrasonic transducer in proximity to the injury;

10 introducing an ultrasound contrast agent into the patient; and
 exciting the at least one ultrasonic transducer to impinge ultrasonic waves at or near the injury, wherein the ultrasound contrast agent facilitates in lowering the cavitation threshold to a level attainable by the ultrasonic waves.

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